MARA-00177

SERVICE MANUAL 1072/1050

marantz

model 1072/1050

Stereophonic Amplifier

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MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, MARANTZ Company has created the ultimate in stereo sound. Only original MARANTZ parts can insure that your MARANTZ product will continue to perform to the specifications for which it is famous.

Parts for your MARANTZ stereo are generally available within 72 hours throughout the nation via a toll-free line to our National Parts Depot in California. The sales professionals who take your call immediately refer to their own desk top computer terminal and can quickly determine the availability and price information you require. If for some reason, your order should exceed our available stock, we usually can instantly provide an alternate replacement part or current delivery information. When the order is placed and confirmed, the computer simultaneously generates "hard copy" orders at the distribution center. As hard copies come directly from the computer to the national parts depot, your requested stock is assembled and prepared for shipment and placed on the first available carrier for delivery to you.

ORDERING PARTS

Phone orders will eliminate mail delays, and we encourage the use of this method. If you order by mail, use MARANTZ parts order forms which are available from our National Parts Depot located at the following address:

SUPERSCOPE NATIONAL PARTS DEPARTMENT
20525 Nordhoff Street
Chatsworth, California 91311
Phone: 1-800-423-5108
1-213-998-9333

The following information must be supplied to eliminate delays in processing your order:

1. Complete address.
2. Complete part numbers.
3. Complete description of parts.
4. Model number for which part is required (indicate MARANTZ).
5. Account number (for account customers only).

Direct consumers will be provided with the current retail prive quotation on available parts in order to advise them of the cost of the parts and shipping.

OVERSEAS PARTS ORDERING

Parts may also be ordered from the following overseas addresses:

CANADA

Superscope Canada, Ltd.
3710 Nashua Drive
Mississauga
Ontario, Canada L4V1M5

AUSTRALIA

Superscope (Australasia) Pty., Ltd.
32 Cross Street (P.O. Box 604)
Brookvale 2100 N.S.W.
Australia

JAPAN

Marantz Japan, Inc.
3622 Kamitsuruma
Sagamihara Shi
Kanagawa, Japan

EUROPE

Superscope Europe, S.A.
Avenue Leopold III, 2
7120 Peronnes-Lez-Binche
Belgium

Marantz France
Rue Louis Armand 9
92600 Asnieres
Hauts-de-Seine
France

Marantz Audio U.K. Ltd.
London Road, 203
Staines
Middlesex
England

Superscope GmbH
Max-Planck-Strasse 22
D-6072 Dreieich 1
West Germany

All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please contact the nearest facility for the necessary assistance.

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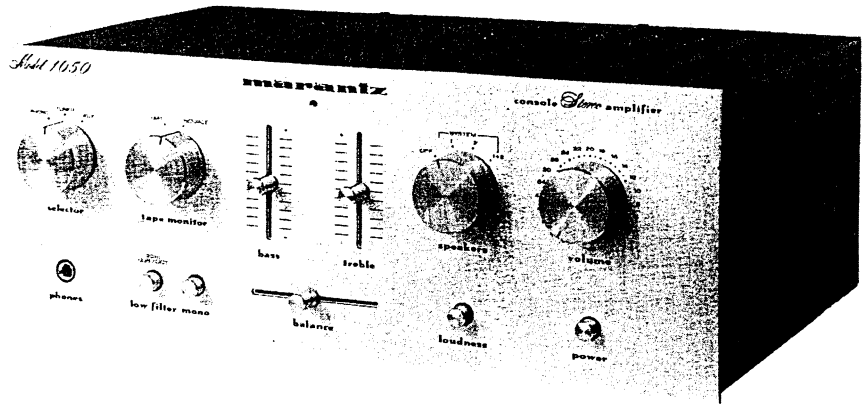


1. INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for the Marantz Model 1050/1072 Stereo Console Amplifier. Servicing information and voltage data included in this manual are intended for use by knowledgeable and experienced personnel only. All instructions should be read carefully. No attempt should be made to proceed without a good understanding of circuitry operation.
The parts list furnishes complete ordering information. Most replacement parts should be ordered from the Marantz Company. However, a simple description is included for parts which can be obtained locally.

2. PRE-AMPLIFIER

Signals from the TUNER and AUX terminals are taken to the SELECTOR SWITCH (SV01).
Signals from the PHONO terminals pass through the phono amplifier (Q401, Q403 and Q405) where they are amplified by 36dB and at the same time undergo RIAA equalization, before going to the SELECTOR SWITCH (SV01). (In the case of the Model 1072, signals coming in from the PHONO 1 and PHONO 2 terminals are selected by means of the SELECTOR SWITCH and then taken the the PHONO amplifier).
After being selected by the SELECTOR SWITCH, the incoming signals are taken to the TAPE MONITOR switch and TAPE OUT terminals.
Signals which enter from the TAPE IN terminals are taken to the TAPE MONITOR SWITCH.
Signals which are selected by the TAPE MONITOR SWITCH are taken to the MONO SWITCH BALANCE and VOLUNE potentiometers, and then enter the preamplifier (QE01 and QE03). The preamplifier has a gain of 19dB and also serves as a tone control amplifier, with the frequency response being controlled by the BASS and TREBLE controls.
After passing through the preamplifier, the signals enter the main amplifier.

3. MAIN AMPLIFIER

The main amplifier contains an NF type high pass filter network which can be switched in and out of circuit by means of the LOW FILTER switch.

4. TROUBLESHOOTING ANALYSIS

1. Excessive line consumption
   a. Check for shorted Q806 through Q809.
   b. Check for shorted transistor Q715, through Q718.
   c. Check for open Q709, Q710, R717, R718.
2. No line consumption or zero bias voltage
   a. Check line cord, fuse, check for shorted Q709, Q710, Q717, Q718.
   b. Check for open rectifiers Q806 through Q809 or open L001.
3. High hum and noise level
   a. Check filter capacitors C808, C809, C801, C803, Q801.

5. POWER AMPLIFIER ADJUSTMENT

ADJUSTMENT OF IDLING CURRENT

Connect a DC voltmeter to between emitters Q715 and Q717. Adjust R717 until 11 mV is reached. Likewise, adjust Q716, Q718 and R718.

6. TEST EQUIPMENT REQUIRED FOR SERVICING

Table 1 lists the test equipment required for servicing the Model 1050/1072 Stereo Console Amplifier. The wattmeter, AC voltmeter, and variable autotransformer may be assembled as a test fixture as shown schematically in Figure 1. The load resistors and AC ammeter may be assembled into a second test fixture as shown in Figure 2.

7. PERFORMANCE VERIFICATION

TEST PROCEDURE

A. TEST EQUIPMENT

Refer to Table 1 for required test equipment.

B. PRELIMINARY PROCEDURES

1. Make the test setup shown in Figure 1 with the instrument controls set in the following positions:

Line Switch	OFF
Variable-line switch	Variable
Wattmeter Switch	ON
Variable Autotransformer	0 V **(fully CCW)**
Load	8 ohms (0.5 mfd—OFF)
Audio Generator	1 kHz
Output	5 V range
Gain	Minimum
AC Voltmeter	30 V range

2. Make sure that connections between the resistive load and the system terminals of the Model 1050/1072 have negligible resistance when compared with the resistance of the load itself. Appreciable resistance in wiring adds to the total load, resulting in inaccurate measurements of output power.

3. Connect amplifier output to load and connect AC cord to line power. Connect shorting plugs to the Phono input jacks of the Model 1050/1072.

Table 1. Test Equipment Required for Servicing

Item	Manufacturer and Model No.	Use
Distortion Analyzer Audio Oscillator AC Voltmeter	Sound Technology Model 1700B	Distortion measurements Sinewave and squarewave signal source voltage measurements (AC)
Oscilloscope	Tektronix Model T932 Philips Model 3232	Waveform analysis and trouble shooting and ASO alignment
Circuit Tester		Trouble shooting
DC Voltmeter	Fluke Model 8000 "Digital" Simpson Model 313, Triplet Model 801	Voltage measurements (DC)
AC Wattmeter	Simpson Model 1379	Monitors primary power to amplifier
AC Ammeter	Commercial Grade (1 ~ 10 A)	Monitors amplifier output under short circuit condition
Line Voltmeter	Simpson Model 1359	Monitors potential of primary power to amplifier
Variable Autotransformer	Superior Electronic Co., Powerstet Model 116B-10A	Adjusts level of primary power to amplifier
Shorting Plug	Use phono plug with 600 ohm across center pin and shell	Shorts amplifier input to eliminate noise pickup
Output Load (8 ohms, ±0.5% 100 W)	Commercial Grade	Provides 8-ohm load for amplifier output termination
Output Load (4 ohms, ±0.5% 100 W)	Commercial Grade	Provides 4-ohm load for amplifier output termination
Output Load Capacitor (0.5 mfd)	Mylar	Provides capacitive load for instability checks
AC Power Control Box	Optional Item. Fabricate in accordance with Figure 1	Monitors and controls primary power for amplifier
Amplifier Output Load Box	Optional Item. Fabricate in accordance with Figure 2	Provides various amplifier loads and can monitor shorted output

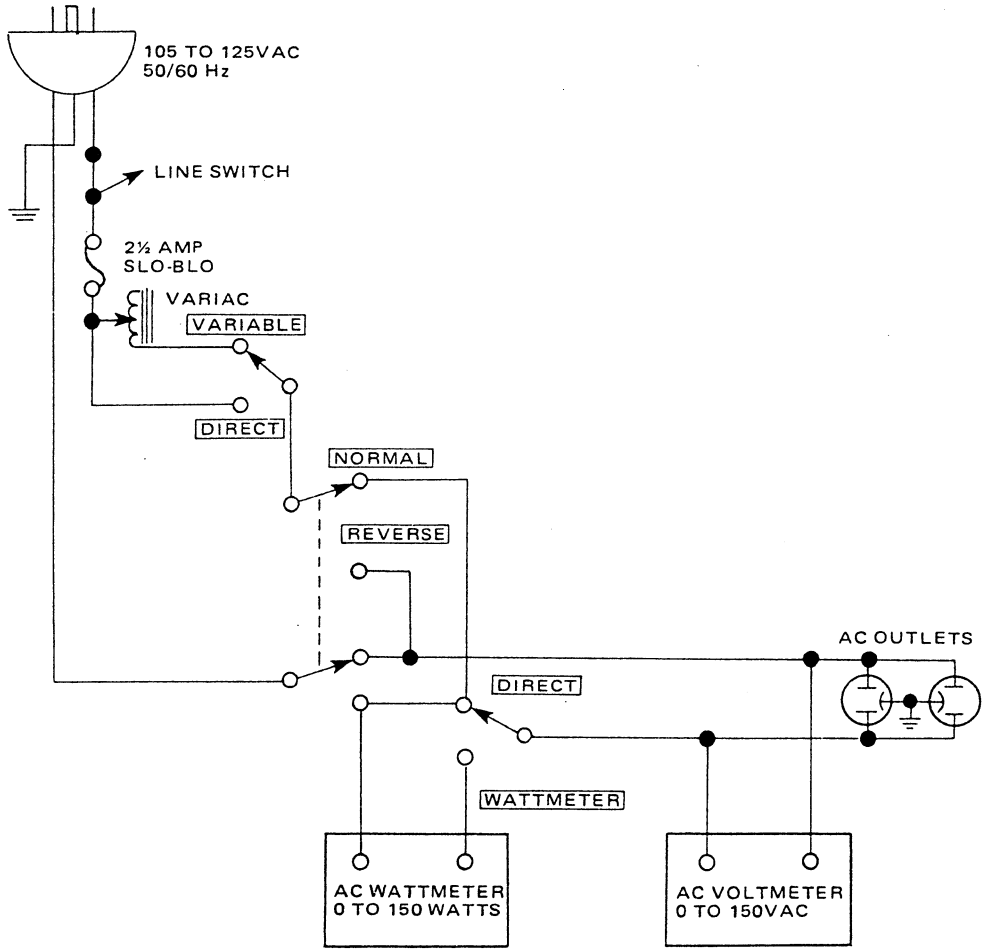


Figure 1. AC Power Control Box Simplified Schematic

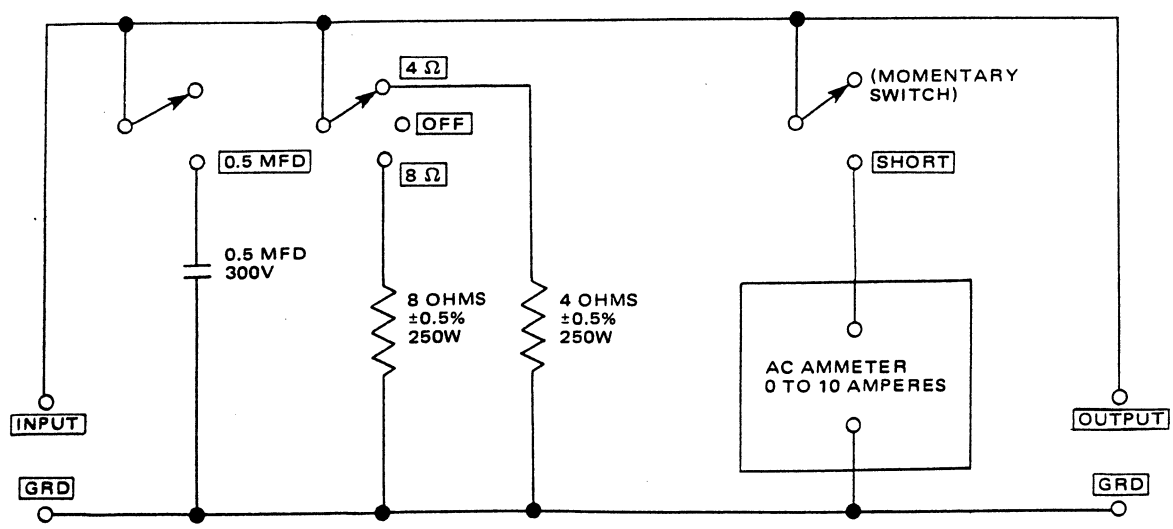


Figure 2. Amplifier Output Load Box Simplified Schematic

C. TOTAL HUM AND NOISE TEST

1. With shorting plugs connected to the Phono input jacks and an 8 ohm resistive load connected across the speaker system output terminals, connect a distortion analyzer across the load.

> **NOTE:**
>
> If the distortion analyzer does not contain a built-in voltmeter, an AC VTVM may be substituted.

2. Set the distortion analyzer controls for voltge measurements and apply power to the amplifier. Set the volume control fully CCW. Set the SELECTOR switch to PHONO.
3. If the distortion analyzer indicates more than 2.0 mV refer to the trouble analysis section of this manual.
4. Set the volume control fully CW. If the distortion analyzer indicates more than 20 mV, refer to the trouble analysis section of this manual.

D MAXIMUM POWER OUTPUT

1. Connect the audio oscillator to the AUX input. Set audio oscillator frequency to 1 kHz. Set SELECTOR switch to AUX.
2. With the distortion analyzer connected across the output load (8-ohm), set the analyzer on the 30 VAC scale.
3. Turn the analyzer on and increase the audio oscillator output to 180 mV. The AC VTVM should read 17 VAC (14.1 VAC For Model 1050 only) or more.

E. HARMONIC DISTORTION TEST

1. Set the frequency of the audio oscillator and the distortion analyzer to 20 kHz.
2. Set the controls of the analyzer for voltage measurement on the 30 volt scale.
3. Adjust the audio oscillator output level until the analyzer meter indicates 17 VAC. (14.1 VAC For Model 1050 only)
4. Switch the distortion analyzer to Set Level and adjust SENSITIVITY for full scale reading on 0 ~ 1% scale.
5. Measure the total harmonic distortion with the analyzer and verify it is less than 0.1%.

> **NOTE:**
>
> Any parasitic oscillation in the amplifier will be displayed on the oscilloscope when capacitance is switched into the load.

6. Switch the distortion analyzer back to SET LEVEL. (Do not readjust sensitivity of analyzer.)
7. Change the frequency of the audio oscillator and distortion analyzer to 1 kHz. Adjust audio oscillator output for a full scale reading on the 0 ~ 1% scale.
8. Measure the distortion, verifying it is no greater than 0.1%.
9. Repeat steps 7 and 8, changing frequency to 20 Hz. Distortion should be no more than 0.1%.
10. Check for parasitic oscillation; there should be none.

8. VOLTAGE CONVERSION

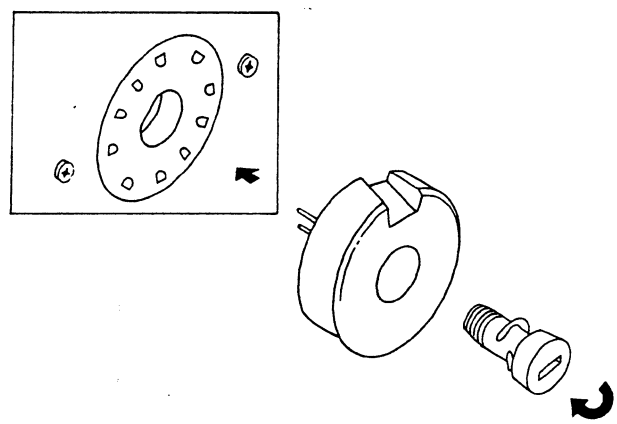
● EUROPEAN MODEL ONLY

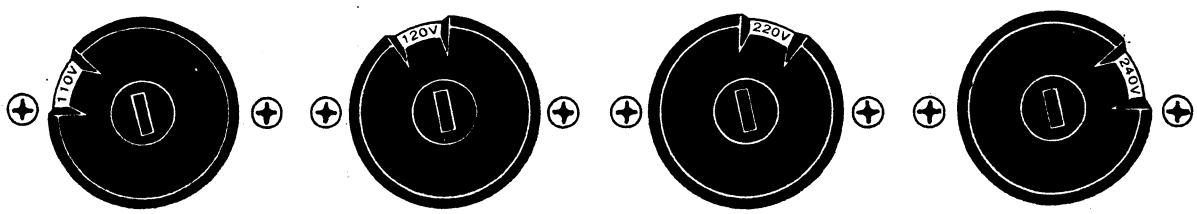
This Model is equipped with a universal power transformer to permit operation at 110, 120, 220 and 240 V AC 50/60 Hz.
To convert the unit to the required voltage, set the plug as illustrated so that you can adjust the voltage as required.

CAUTION

DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE.

Figure 2. Voltage Conversion Chart

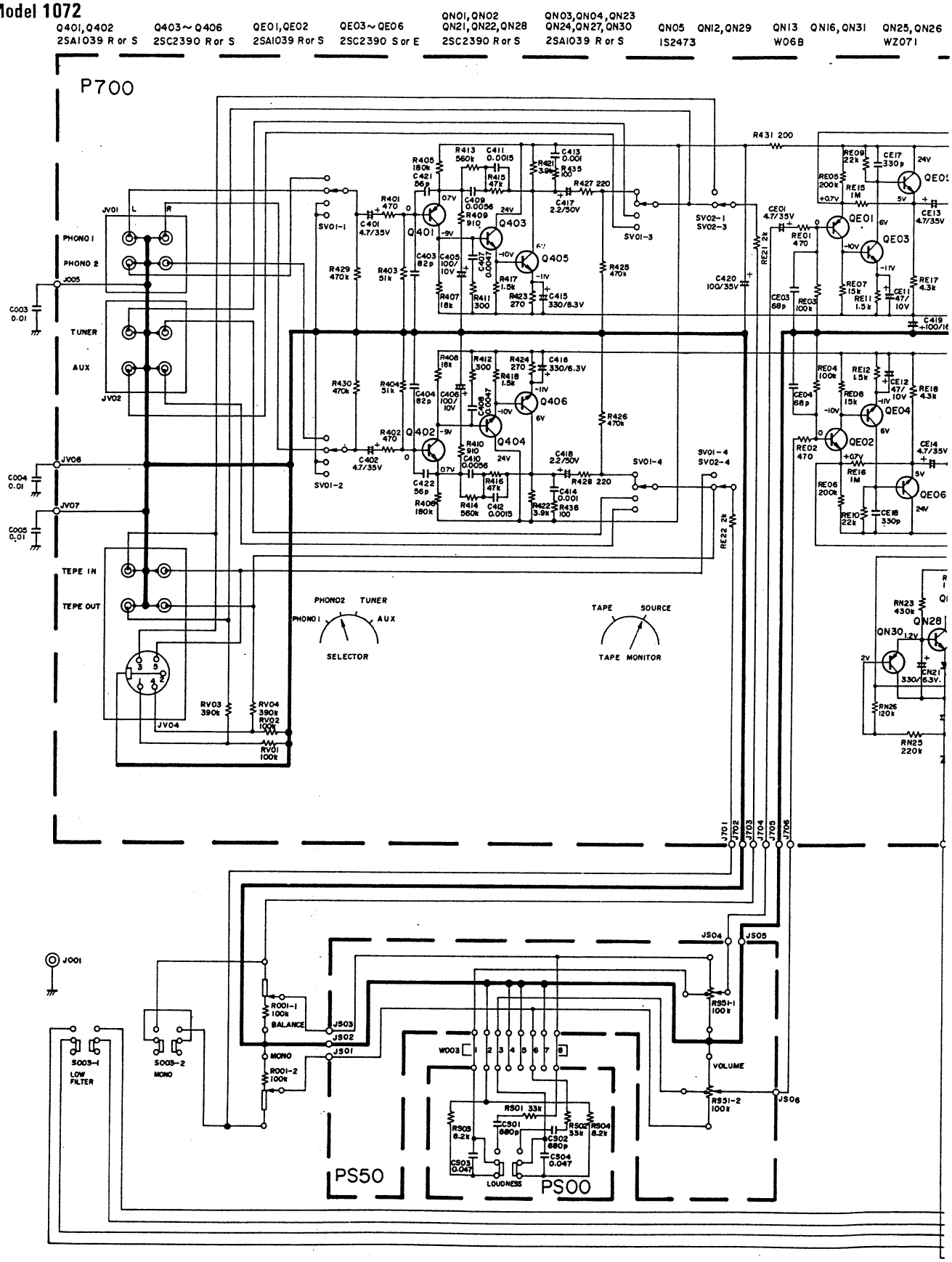




For 110V Operation | For 120V Operation | For 220V Operation | For 240V Operation

9. SCHEMATIC DIAGRAM

9.1 Model 1072



)Y01	Q701 ~ Q704	Q705, Q706	Q707, Q708 Q711, Q712	Q709, Q710	Q713, Q714	Q715, Q716	Q717, Q718	Q719, Q720	Q721	Q722
ED SLP-132B	2SA1039 R or S	2SC2390 R or S	2SC2235 O or Y	2SC2390 S or E	2SA965 O or Y	2SD718 R or O	2SB688 R or O	1S2471	WZ-240	W06B

Q801
2SC1627A O or Y

Q802
2SC2390 S or E

Q803
WZ-071

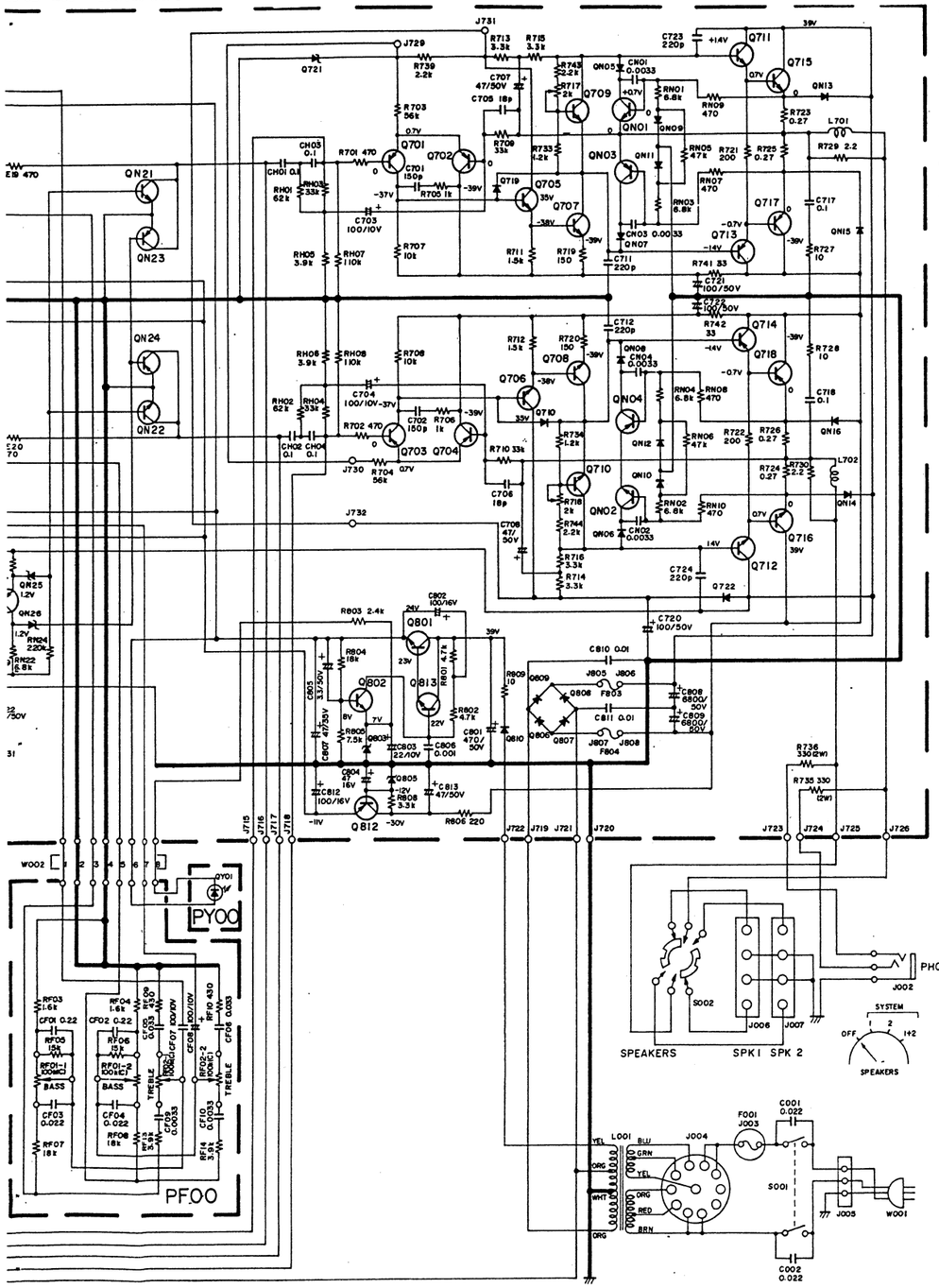
Q805
WZ-120

Q806 ~ Q809
MAIN POWER SUPPLY

Q810
W06B

Q812
2SA817

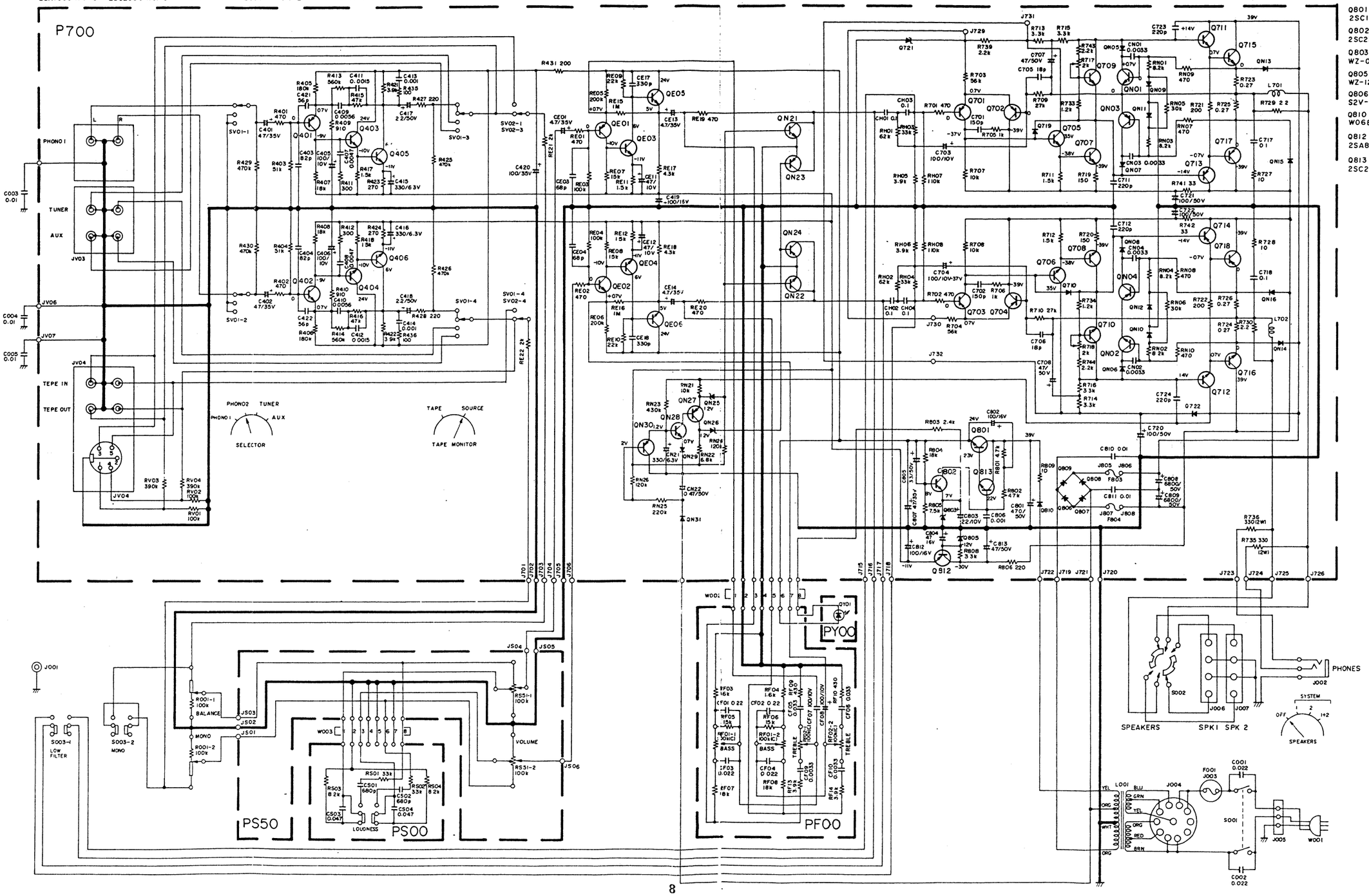
Q813
2SC2390



9.2 Model 1050

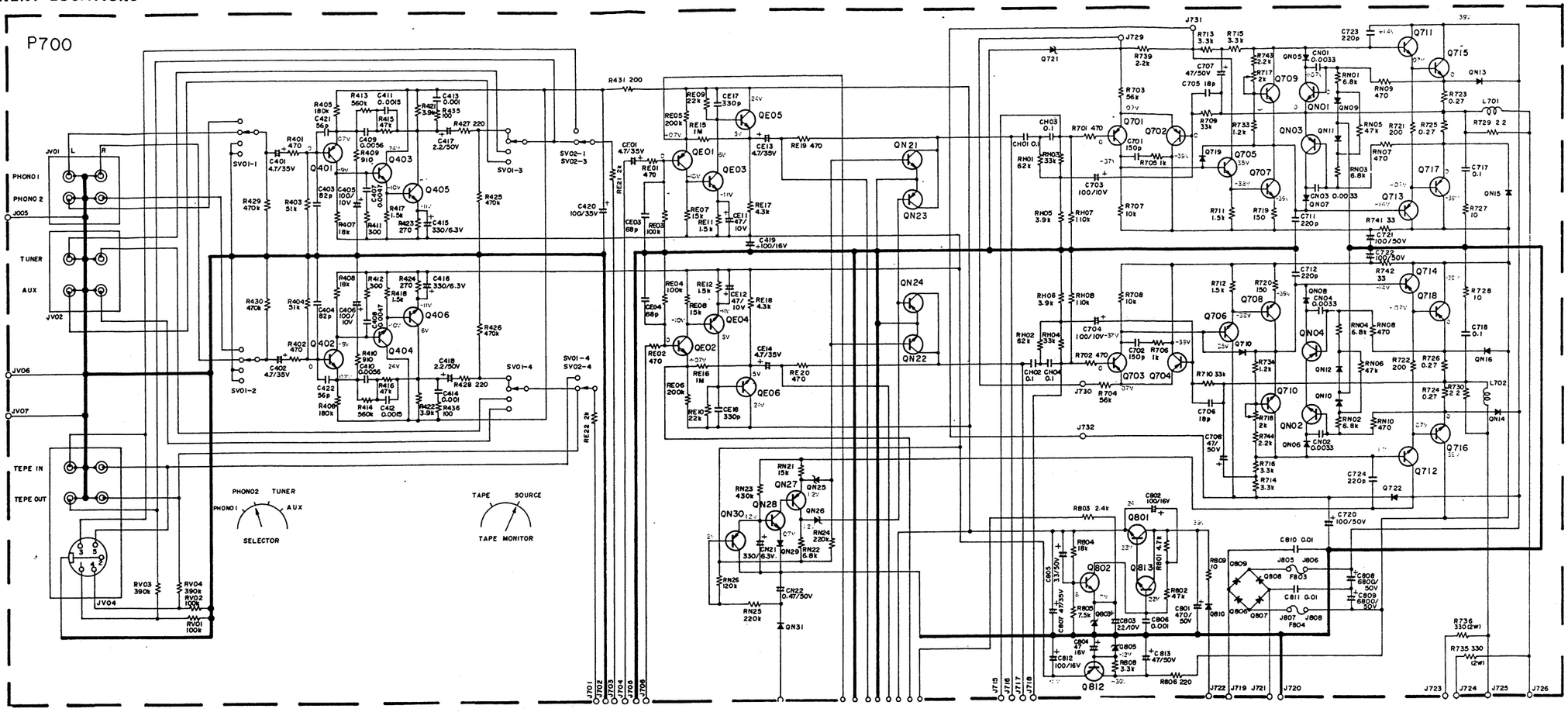
Q401, Q402 2SA1039 R or S
Q403 ~ Q406 2SC2390 R or S
QE01, QE02 2SA1039 R or S
QE03 ~ QE06 2SC2390 S or E
QN01, QN02 QN21, QN22, QN28 2SC2390 R or S
QN03, QN04, QN23 QN24, QN27, QN30 2SA1039 R or S
QN05 QN12, QN29 1S2473
QN13 QN16, QN31 W06B
QN25, QN26 WZ071
QY01 LED SLP-1328
Q701 ~ Q704 2SA1039 R or S
Q705, Q706 2SC2390 R or S
Q707, Q708 Q711, Q712 2SC1627A O or Y
Q709, Q710 2SC2390 S or E
Q713, Q714 2SC817A O or Y
Q715, Q716 2SD716 R or O
Q717, Q718 2SB686 R or O
Q719, Q720 1S2471
Q721 WZ-240
Q722 W06B

Q801 2SC1627A O or Y
Q802 2SC2390 S or E
Q803 WZ-071
Q805 WZ-120
Q806 ~ Q809 S2V-20
Q810 W06B
Q812 2SA817
Q813 2SC2390

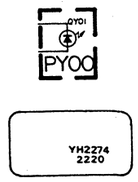


10. DIAGRAM AND COMPONENT LOCATIONS

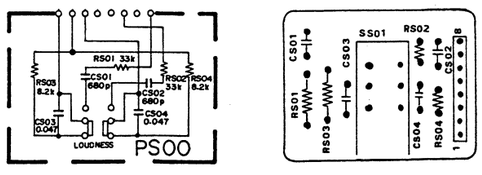
10.1 Main Assembly (P700) Schematic Diagram and Component Locations



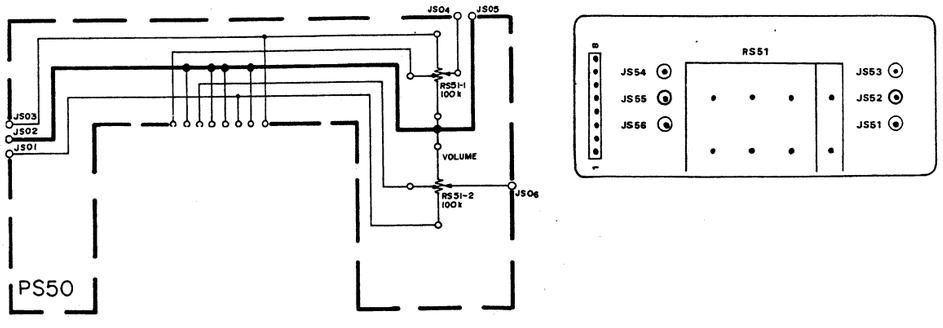
10.2 LED Lamp Assembly (PY00) Schematic Diagram and Component Locations

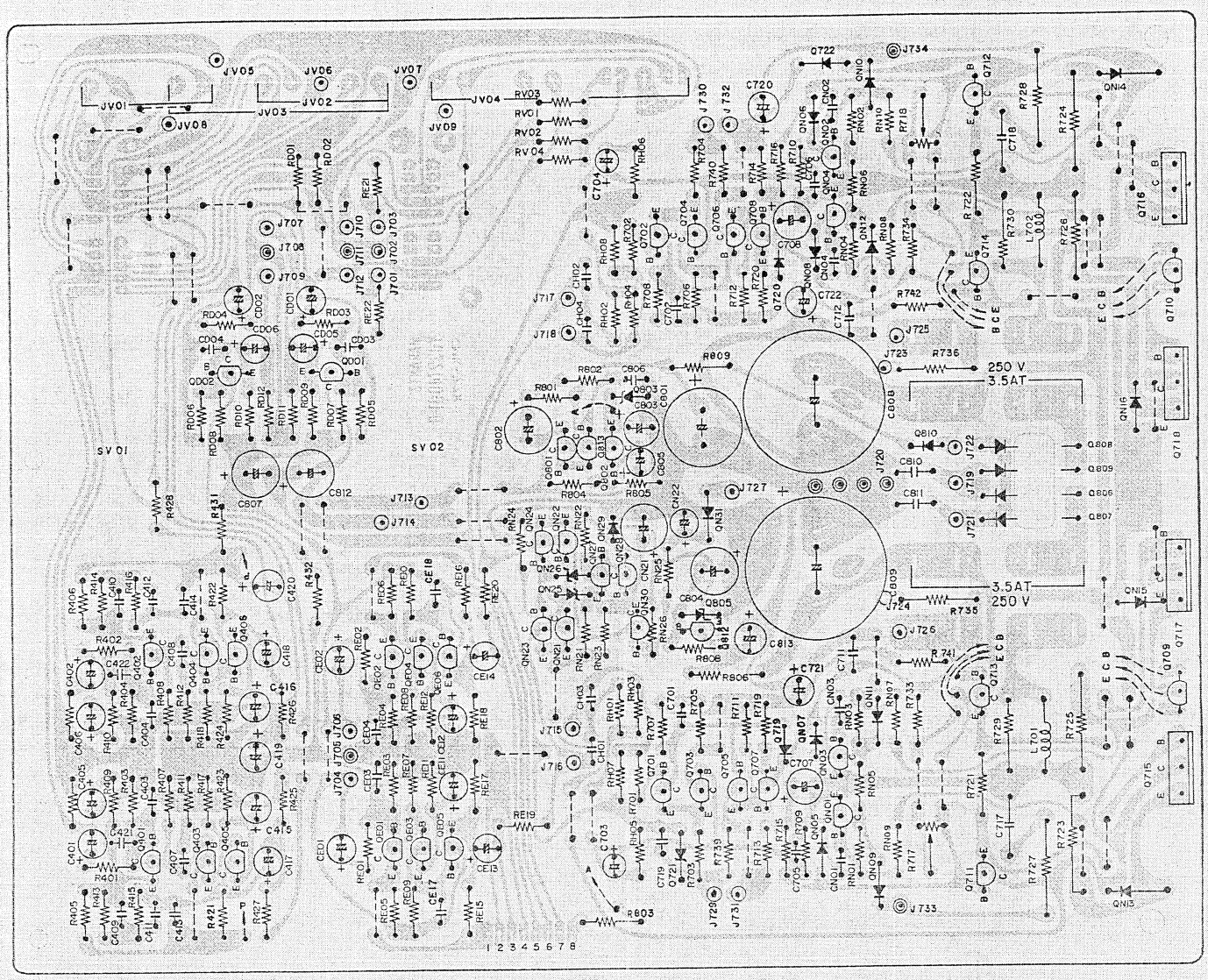


10.3 Loudness Assembly (PS00) Schematic Diagram and Cpmponent Locations

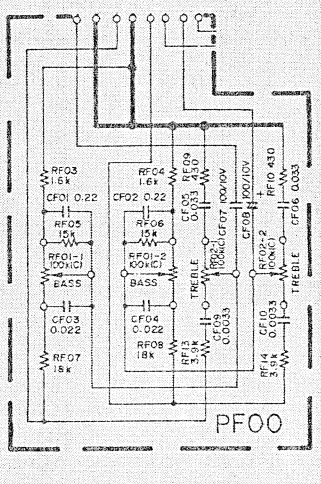


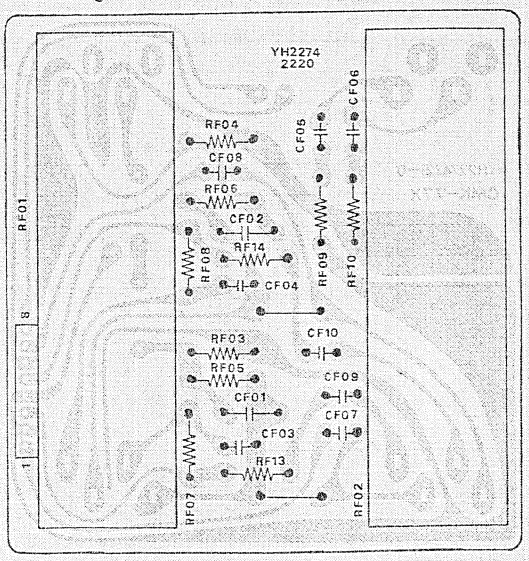
10.4 Volume Assembly (PS50) Schematic Diagram and Component Locations



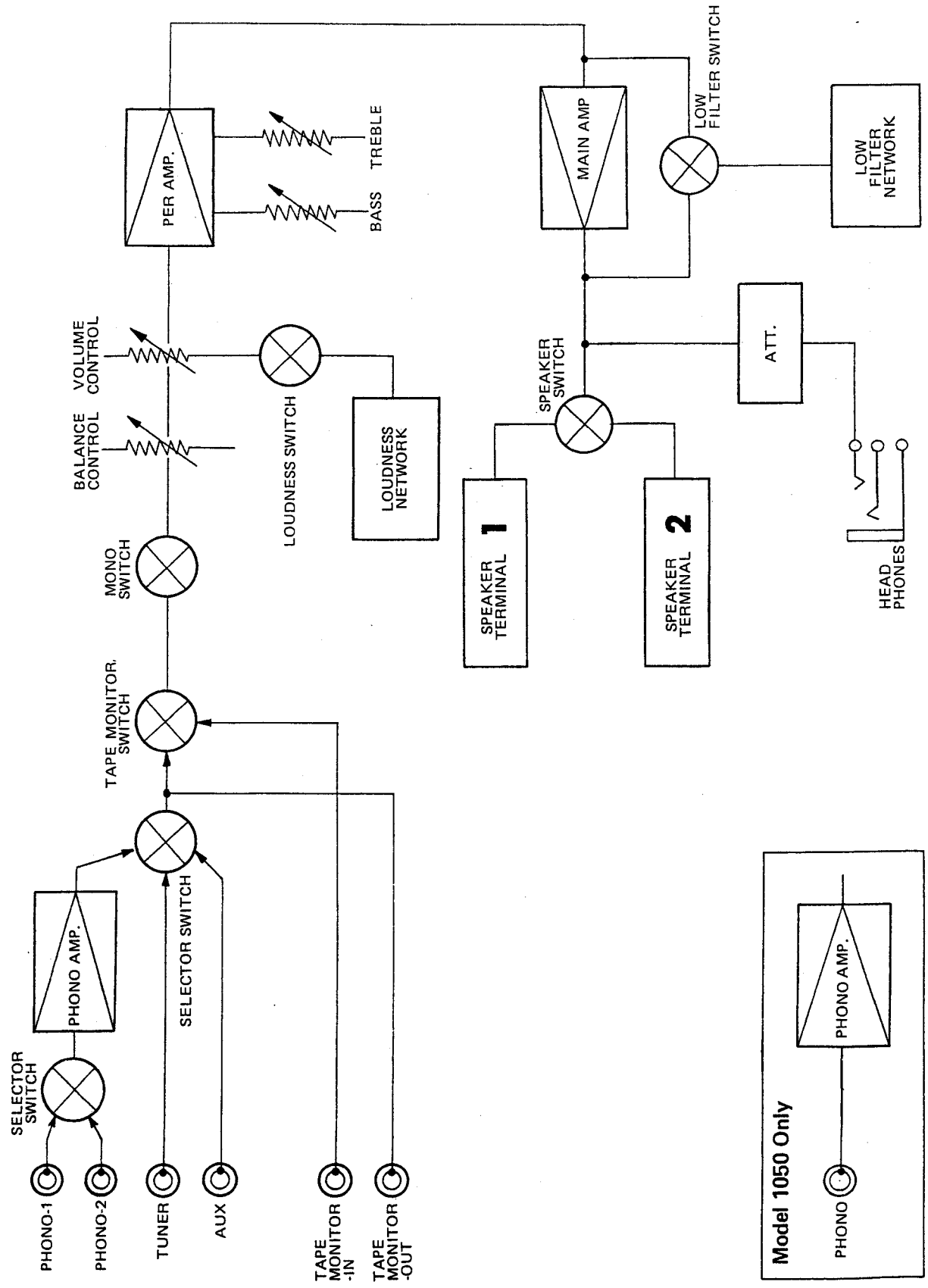


10.5 Tone Assembly (PF00) Schematic Diagram and Component Locations



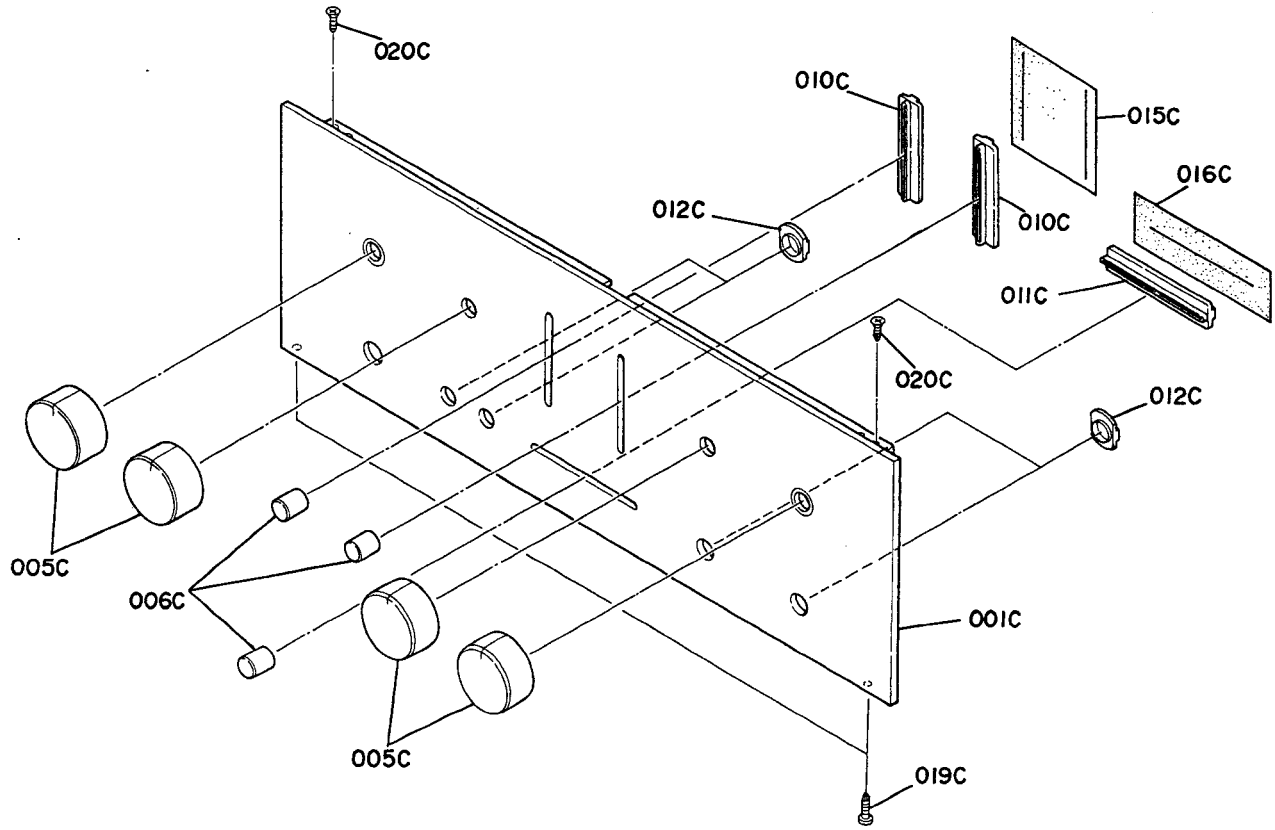


11. BLOCK DIAGRAM



12. EXPLODED MECHANICAL DIAGRAM

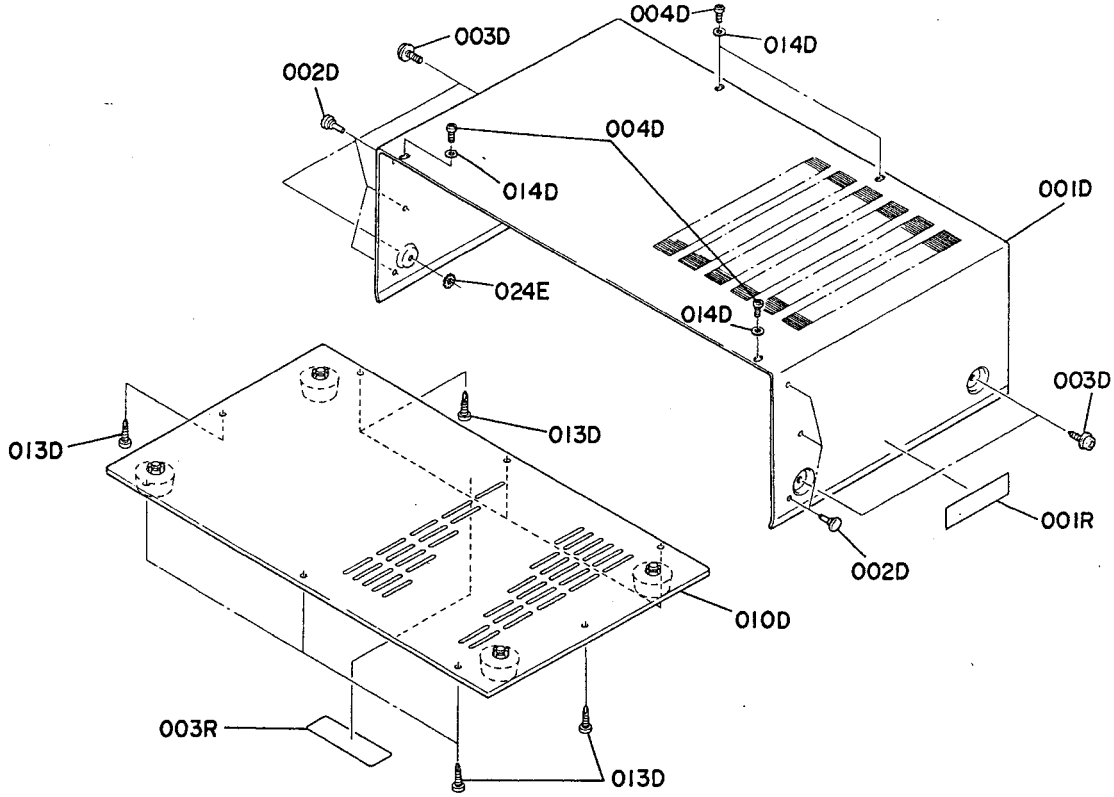
- [C01-99] Front Panel



REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
			M1050, ONLY
A	1	2230063400	Front Panel Assembly
001C	1	2230063012	Escutcheon
010C	2	2970259010	Bushing
011C	1	2926259042	Bushing
012C	4	2978259012	Bushing
015C	1	2970303012	Mask
016C	1	2926303020	Mask
			M1072, ONLY
A	1	2274063400	Front Panel Assembly (Gold)
A1	1	2274063410	Front Panel Assembly (Black)
001C	1	2274063012	Escutcheon (Gold)
001C	1	2274063112	Escutcheon (Black)
010C	2	2970259010	Bushing
011C	1	2926259042	Bushing
012C	4	2978259012	Bushing
015C	1	2970303012	Mask
016C	1	2926303020	Mask

REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
005C	4	2258154010	Knob
006C	3	2970154012	Knob
019C	3	51280308B0	B.H. Tapped Screw B3 x 8
020C	2	51340306B0	F.H. Tapped Screw F3 x 6

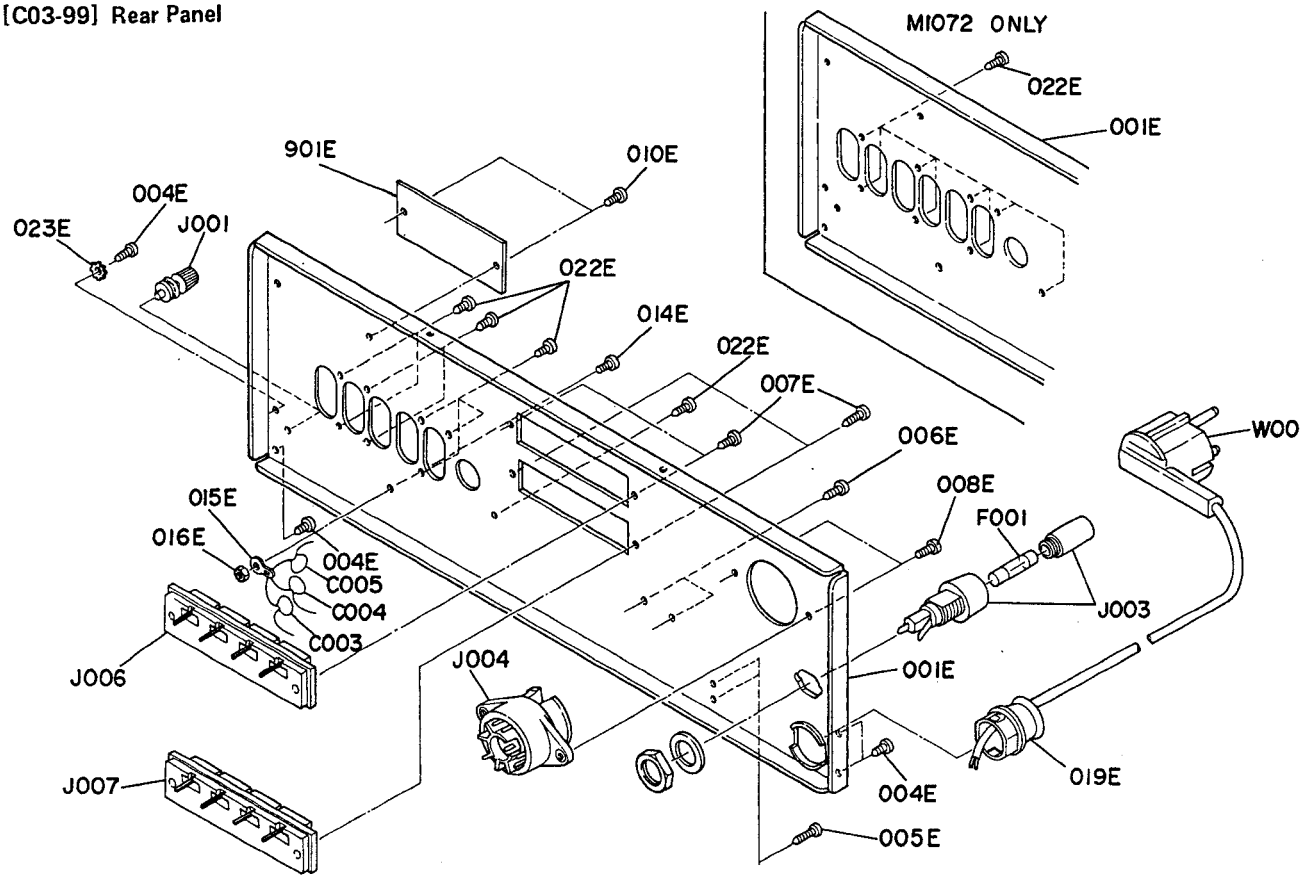
- [C02-99] Lid. (Top cover)



REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
001D	1	2258257010	Lid, Top Cover
002D	6	2991259010	Bushing
003D	4	51260408U0	F. Washer Screw F4 x 8
004D	4	51280308U0	B.H. Tapped Screw B3 x 8
010D	1	2258257502	Lid Assembly Bottom Cover
013D	8	51280410U0	B.H. Tapped Screw B4 x 10
014D	4	59030805P1	Washer

REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
024E	1	54050400R0	T.L. Washer, OR
001R	1	2932861012	Label
003R	1	2578861010	Label

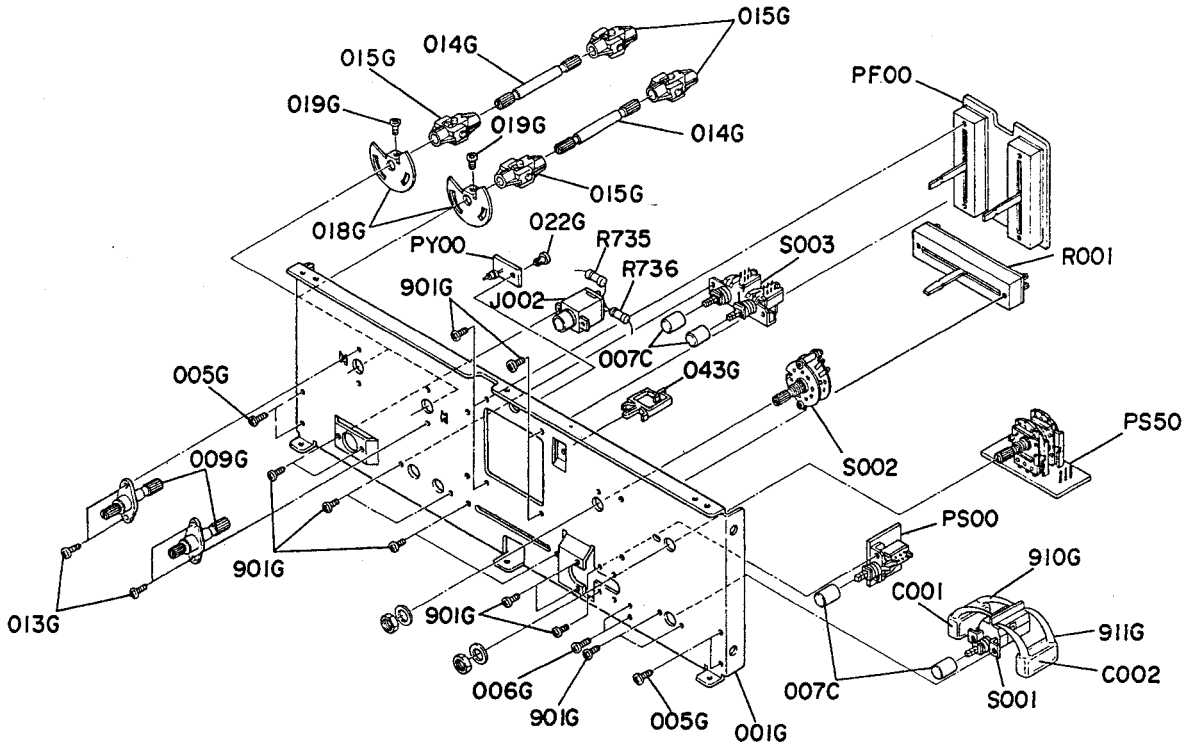
● [C03-99] Rear Panel



REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
			(M1050, ONLY)
001E	1	2230160223	Bracket, Rear Panel
			(M1072, ONLY)
001E	1	2274160223	Bracket, Rear Panel
004E	4	51280308U0	B.H. Tapped Screw B3 x 8
005E	2	51280308U0	B.H. Tapped Screw B3 x 8
006E	2	51280308U0	B.H. Tapped Screw B3 x 8
007E	4	51280308U0	B.H. Tapped Screw B3 x 8
008E	2	51100308S9	B.H.M. Screw B3 x 8
010E	2	51760306B0	OS Tapped Screw B3 x 6
014E	1	51100306S9	B.H.M. Screw B3 x 6
015E	1	62030049W0	Lug
016E	1	53110303A9	Hexagon Nut
019E	1	2286259110	Bushing
022E	8	51280308U0	B.H. Tapped Screw B3 x 8
023E	1	54050300R0	T.L. Washer OR

REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
901E	1	2230265010	Indicator (M1050, ONLY)
901E	1	2274265010	Indicator (M1072, ONLY)
C003	1	DK18103310	Ceramic Cap. 0.01μF +100% −0
C004	1	DK18103310	Ceramic Cap. 0.01μF +100% −0
C005	1	DK18103310	Ceramic Cap. 0.01μF +100% −0
F001	1	FS10063800	Fuse 630mAT (M1050, ONLY)
F001	1	FS10080800	Fuse 800mAT (M1072, ONLY)
J001	1	YL03010240	Terminal
J003	1	YJ08000220	Jack, Huse Holder
J004	1	BY03110010	Plug, Voltage Selector
J006	1	YT03040160	Terminal
J007	1	YT03040160	Terminal
W001	1	YC01900030	A.C. Power Cord

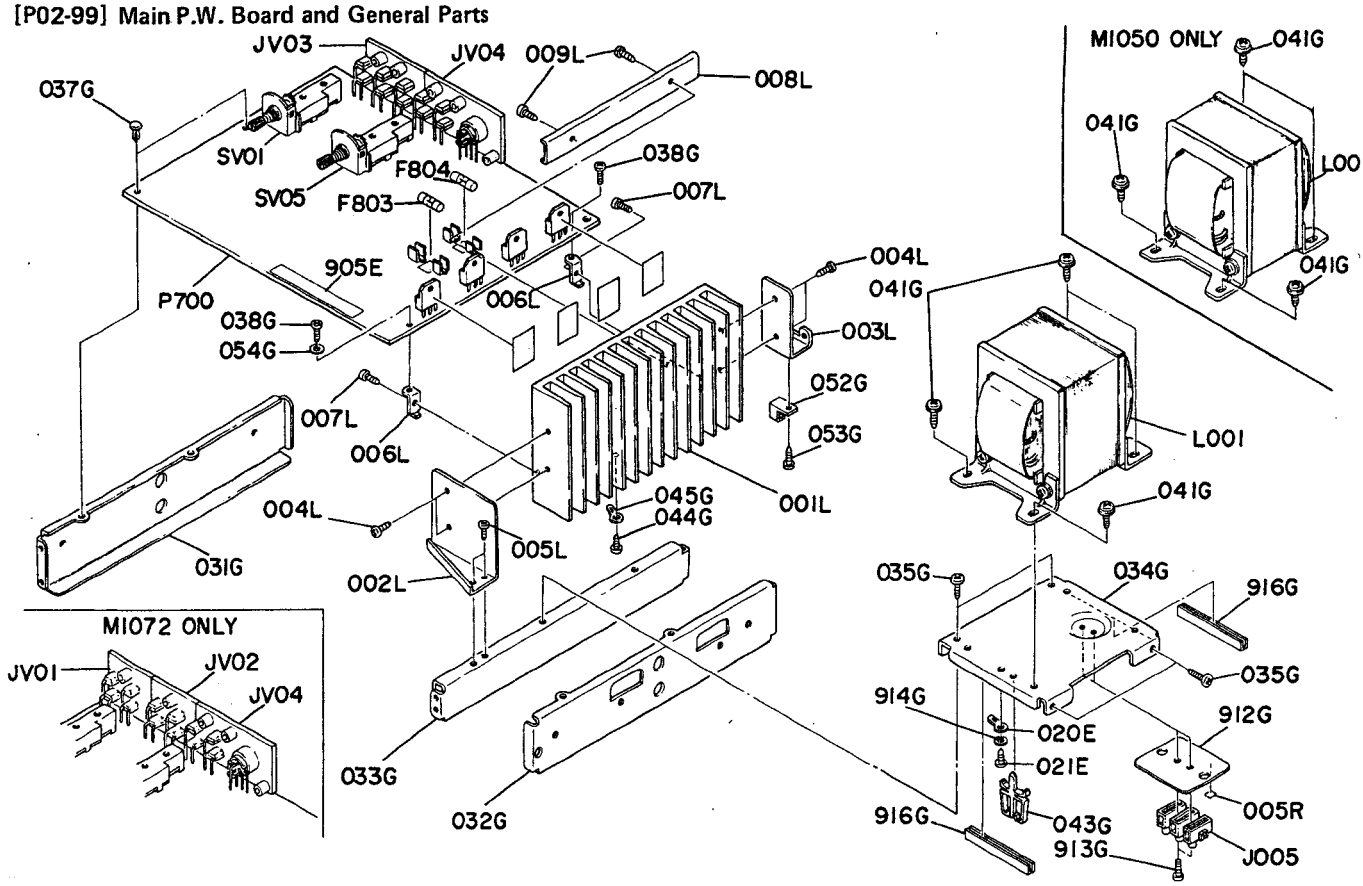
- [P01-99] Front Chassis and General Parts



REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
007C	4	2259154030	Knob
001G	1	2258160013	Bracket, Front Chassis
005G	4	5128030880	B.H. Tapped Screw B3 x 8
006G	2	5128030880	B.H. Tapped Screw B3 x 8
009G	2	2258112500	Shaft, K
013G	4	5128030580	B.H. Tapped Screw B3 x 5
014G	2	2258112020	Shaft
015G	4	2258125510	Joint, K
018G	2	2258062012	Click
019G	2	51650304D9	Set Screw H.P. 3 x 4
022G	1	2276005050	Clamper
043G	1	2886005030	Clamper
901G	14	51100306A9	B.H.M. Screw B3 x 6
910G	1	3926120010	Insulator
911G	1	3926120010	Insulator
C001	1	DF17223800	Film Cap. 0.022μF ±20% 1000V
C002	1	DF17223800	Film Cap. 0.022μF ±20% 1000V
J002	1	YJ01001200	Jack, Head Phone
R001	1	RS01040090	Variable Resistor 100KΩ x 2
S001	1	SP02010370	Push Switch, Power
S002	1	SR02040110	Rotaly Switch
S003	1	SP02020310	Push Switch
R735	1	GA05331020	Resistor 330Ω ±5% 2W
R736	1	GA05331020	Resistor 330Ω ±5% 2W

REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
PF00	1	YH22742210	P.W. Board, Tone
	1	ZZ39602210	P.W. Board Assembly
PS00	1	YH22741210	P.W. Board, Loudness
	1	ZZ22741210	P.W. Board Assembly
PS50	1	YH22741220	P.W. Board, Volume
	1	ZZ22741220	P.W. Board Assembly
PY00	1	YH22742220	P.W. Board, LED
	1	ZZ22742220	P.W. Board Assembly

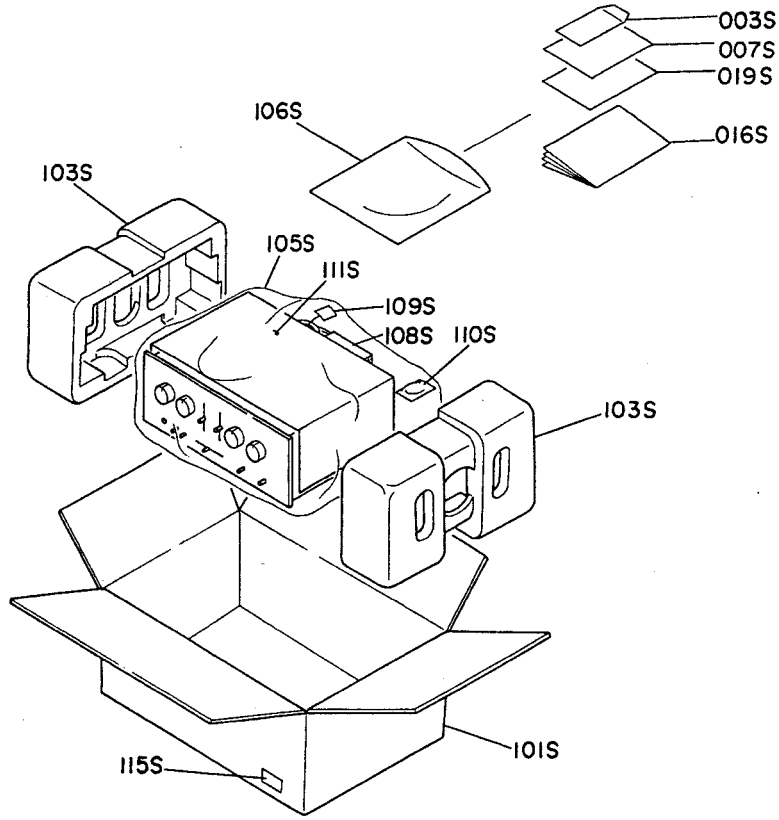
• [P02-99] Main P.W. Board and General Parts



REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
020E	1	62030049W0	Lug
021E	1	51280306B0	B.H. Tapped Screw B3 x 6
905E	1	2205861010	Label
031G	1	2258126010	Stay, Left
032G	1	2258126020	Stay, Riget
033G	1	2258126030	Stay, Center
034G	1	2258160022	Bracket (M1050, ONLY)
034G	1	2274160020	Bracket (M1072, ONLY)
035G	4	51280408B0	B.H. Tapped Screw B4 x 8
037G	2	2276005050	Clamper
038G	2	51280308B0	B.H. Tapped Screw B3 x 8
041G	4	51490512A9	L. Washer Screw L5 x 12
043G	1	2886005030	Clamper
044G	1	51280306B0	B.H. Tapped Screw B3 x 6
045G	1	52040029W0	Lug
052G	1	2887005012	Clamper
053G	1	51280308B0	B.H. Tapped Screw B3 x 8
054G	1	2258118010	Spacer
912G	1	2970120040	Insulator
913G	2	51280314B0	B.H. Tapped Screw B3 x 14
914G	1	54040302A0	Spring Washer
916G	2	2218259020	Bushing
001L	1	2274267012	Heatsink
002L	1	2258160040	Bracket
003L	1	2258160050	Bracket
004L	4	51280308B0	B.H. Tapped Screw B3 x 8
005L	2	51280308B0	B.H. Tapped Screw B3 x 8

REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
006L	2	2231160040	Bracket
007L	2	51280308B0	B.H. Tapped Screw B3 x 8
008L	1	2258005010	Clamper
009L	2	51280314B0	B.H. Tapped Screw B3 x 14
005R	1	2882861020	Label
J005	1	YL09030010	Terminal
L001	1	TS18304010	Power Transformer (M1050, ONLY)
L001	1	TS18303010	Power Transformer (M1072, ONLY)
P700	1	YG22740010	P.W. Board, Main (M1050, ONLY)
	1	ZZ22300010	P.W. Board Assembly
P700	1	YG22740010	P.W. Board, Main (M1072, ONLY)
	1	ZZ22748010	P.W. Board Assembly
F803	1	FS10350800	Fuse 3.5AT
F804	1	FS10350800	Fuse 3.5AT
JV01	1	YT02040280	Terminal (M1072, ONLY)
JV02	1	YT02040280	Terminal (M1072, ONLY)
JV03	1	YT02060140	Terminal (M1050, ONLY)
JV04	1	YT02050010	Terminal
SV01	1	SR04030220	Rotary Switch (M1050, ONLY)
SV01	1	SR04040130	Rotary Switch (M1072, ONLY)
SV05	1	SR04020150	Rotary Switch

- [H01-99] Packing Materials



REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
003S	1	2818813010	Envelope
007S	1	9630000180	Guarantee Card
016S	1	2230851310	Instructions
019S	1	2230851030	Instructions (M1050, ONLY)
019S	1	2274851030	Instructions (M1072, ONLY)
101S	1	2230801012	Packing Case (M1050, ONLY)
101S	1	2274801012	Packing Case (M1072, ONLY)
103S	2	4214809013	Cushion
105S	1	9014335330	Polyethy Bag
106S	1	9013025010	Polyethy Bag

REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
108S	1	2864804010	Sleeve
109S	1	9560000043	Hang Tag
110S	1	2731821010	Silicagel
111S	1	2918107160	Sheet
115S	3	9526019060	Serial No. Card

13. ELECTRICAL PARTS LIST

REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
			P700-MAIN CIRCUIT BOARD (M1050, ONLY)
P700	1	YG22740010	P.W. Board, Main
	1	ZZ22300010	P.W. Board Assembly
			(M1072, ONLY)
P700	1	YG22740010	P.W. Board, Main
	1	ZZ22748010	P.W. Board Assembly
			P700-CAPACITORS
C401	1	EA47503590	Elect 4.7μF 35V
C402	1	EA47503590	Elect 4.7μF 35V
C403	1	DD16820010	Ceramic 82pF ±10%
C404	1	DD16820010	Ceramic 82pF ±10%
C405	1	EA10701090	Elect 100μF 10V
C406	1	EA10701090	Elect 100μF 10V
C407	1	DF15472300	Film 0.0047μF ±5%
C408	1	DF15472300	Film 0.0047μF ±5%
C409	1	DF15562300	Film 0.0056μF ±5%
C410	1	DF15562300	Film 0.0056μF ±5%
C411	1	DF15152300	Film 0.0015μF ±5%
C412	1	DF15152300	Film 0.0015μF ±5%
C413	1	DF15102300	Film 0.001μF ±5%
C414	1	DF15102300	Film 0.001μF ±5%
C415	1	EA33700690	Elect 330μF 6.3V
C416	1	EA33700690	Elect 330μF 6.3V
C417	1	EA22505090	Elect 2.2μF 50V
C418	1	EA22505090	Elect 2.2μF 50V
C419	1	EA10701690	Elect 100μF 16V
C420	1	EA10703590	Elect 100μF 35V
C421	1	DD15560370	Ceramic 56pF ±5%
C422	1	DD15560370	Ceramic 56pF ±5%
C701	1	DD15151370	Ceramic 150pF ±5%
C702	1	DD15151370	Ceramic 150pF ±5%
C703	1	EA10701090	Elect 100μF 10V
C704	1	EA10701090	Elect 100μF 10V
C705	1	DD15180370	Ceramic 18pF ±5%
C706	1	DD15180370	Ceramic 18pF ±5%
C707	1	EA47605090	Elect 47μF 50V
C708	1	EA47605090	Elect 47μF 50V
C711	1	DK16221510	Ceramic 220pF ±10% 500V
C712	1	DK16221510	Ceramic 220pF ±10% 500V
C717	1	DF17104540	Film 0.1μF ±20% 100V
C718	1	DF17104540	Film 0.1μF ±20% 100V
C720	1	EA10705090	Elect 100μF 50V
C721	1	EA10705090	Elect 100μF 50V
C722	1	EA10705090	Elect 100μF 50V
C723	1	DK16221510	Ceramic 220pF ±10% 500V
C724	1	DK16221510	Ceramic 220pF ±10% 500V
C801	1	EA47705090	Elect 470μF 50V
C802	1	EA10701690	Elect 100μF 16V
C803	1	EA22601090	Elect 22μF 10V
C804	1	EA47601690	Elect 47μF 16V
C805	1	EA33505090	Elect 3.3μF 50V
C806	1	DF17102010	Film 0.001μF ±20%
C807	1	EA47603590	Elect 47μF 35V
C808	1	EB68805020	Elect 6800μF 50V
C809	1	EB68805020	Elect 6800μF 50V
C810	1	DK18103510	Ceramic 0.01μF 500V
C811	1	DK18103510	Ceramic 0.01μF 500V
C812	1	EA10701690	Elect 100μF 16V
C813	1	EA47605090	Elect 47μF 50V

REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
CE01	1	EA47503590	Elect 4.7μF 35V
CE02	1	EA47503590	Elect 4.7μF 35V
CE03	1	DD15680370	Ceramic 68pF ±5%
CE04	1	DD15680370	Ceramic 68pF ±5%
CE11	1	EA47601090	Elect 47μF 10V
CE12	1	EA47601090	Elect 47μF 10V
CE13	1	EA47503590	Elect 4.7μF 35V
CE14	1	EA47503590	Elect 4.7μF 35V
CE17	1	DD15331370	Ceramic 330pF ±5%
CE18	1	DD15331370	Ceramic 330pF ±5%
CH01	1	DF16104300	Film 0.1μF ±10%
CH02	1	DF16104300	Film 0.1μF ±10%
CH03	1	DF16104300	Film 0.1μF ±10%
CH04	1	DF16104300	Film 0.1μF ±10%
CN01	1	DF16332300	Film 0.0033μF ±10%
CN02	1	DF16332300	Film 0.0033μF ±10%
CN03	1	DF16332300	Film 0.0033μF ±10%
CN04	1	DF16332300	Film 0.0033μF ±10%
CN21	1	EA33700690	Elect 330μF 6.3V
CN22	1	EA47405090	Elect 0.47μF 50V
			P700-RESISTORS (All Resistors are ±5% and ¼W)
R401	1	GD05471140	470Ω
R402	1	GD05471140	470Ω
R403	1	GD05513140	51KΩ
R404	1	GD05513140	51KΩ
R405	1	GD05184140	180KΩ
R406	1	GD05184140	180KΩ
R407	1	GD05183140	18KΩ
R408	1	GD05183140	18KΩ
R409	1	GD05911140	910Ω
R410	1	GD05911140	910Ω
R411	1	GD05301140	300Ω
R412	1	GD05301140	300Ω
R413	1	GD05564140	560KΩ
R414	1	GD05564140	560KΩ
R415	1	GD05473140	47KΩ
R416	1	GD05473140	47KΩ
R417	1	GD05152140	1.5KΩ
R418	1	GD05152140	1.5KΩ
R421	1	GD05392140	3.9KΩ
R422	1	GD05392140	3.9KΩ
R423	1	GD05271140	270Ω
R424	1	GD05271140	270Ω
R425	1	GD05224140	220KΩ
R426	1	GD05224140	220KΩ
R427	1	GD05221140	220Ω

REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION		
R428	1	GD05221140	220Ω		
R429	1	GD05474140	470KΩ		
R430	1	GD05474140	470KΩ		
R431	1	GG05201140	200Ω		
R435	1	GD05101140	100Ω		
R436	1	GD05101140	100Ω		
R701	1	GD05471140	470Ω		
R702	1	GD05471140	470Ω		
R703	1	GD05563140	56KΩ		
R704	1	GD05563140	56KΩ		
R705	1	GD05102140	1KΩ		
R706	1	GD05102140	1KΩ		
R707	1	GD05103140	10KΩ		
R708	1	GD05103140	10KΩ		
R711	1	GD05152140	1.5KΩ		
R712	1	GD05152140	1.5KΩ		
R713	1	GD05332140	3.3KΩ		
R714	1	GD05332140	3.3KΩ		
R715	1	GD05332140	3.3KΩ		
R716	1	GD05332140	3.3KΩ		
R717	1	RA02020180	Trimming, 2KΩ		
R718	1	RA02020180	Trimming, 2KΩ		
R719	1	GG05151140	150Ω		
R720	1	GG05151140	150Ω		
R721	1	GG05201120	200Ω	½W	
R722	1	GG05201120	200Ω	½W	
R723	1	GB05272020	0.27Ω	2W	
R724	1	GB05272020	0.27Ω	2W	
R725	1	GB05272020	0.27Ω	2W	
R726	1	GB05272020	0.27Ω	2W	
R727	1	GA05100020	10Ω	2W	
R728	1	GA05100020	10Ω	2W	
R729	1	RC10022120	2.2Ω	±10%	½W
R730	1	RC10022120	2.2Ω	±10%	½W
R733	1	GD05122140	1.2KΩ		
R734	1	GD05122140	1.2KΩ		
R739	1	GG05222140	2.2KΩ		
R741	1	GG05330140	33Ω		
R742	1	GG05330140	33Ω		
R743	1	GD05222140	2.2KΩ		
R744	1	GD05222140	2.2KΩ		
R801	1	GG05472140	4.7KΩ		
R802	1	GG05472140	4.7KΩ		
R803	1	GG05242120	2.4KΩ	½W	
R804	1	GD05183140	18KΩ		
R805	1	GD05572140	7.5KΩ		
R806	1	RF05221140	220Ω		
R808	1	GG05332120	3.3KΩ	½W	
R809	1	RF05100140	10Ω		
			(M1050, ONLY)		
R709	1	GD05273140	27KΩ		
R710	1	GD05273140	27KΩ		
			(M1072, ONLY)		
R709	1	GD05333140	33KΩ		
R710	1	GD05333140	33KΩ		

REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
RE01	1	GD05471140	470Ω
RE02	1	GD05471140	470Ω
RE03	1	GD05104140	100KΩ
RE04	1	GD05103140	100KΩ
RE05	1	GD05204140	200KΩ
RE06	1	GD05204140	200KΩ
RE07	1	GD05153140	15KΩ
RE08	1	GD05153140	15KΩ
RE09	1	GD05223140	22KΩ
RE10	1	GD05223140	22KΩ
RE11	1	GD05152140	1.5KΩ
RE12	1	GD05152140	1.5KΩ
RE15	1	GD05105140	1MΩ
RE16	1	GD05105140	1MΩ
RE17	1	GD05432140	4.3KΩ
RE18	1	GD05432140	4.3KΩ
RE19	1	GD05471140	470Ω
RE20	1	GD05471140	470Ω
RE21	1	GD05202140	2KΩ
RE22	1	GD05202140	2KΩ
RH01	1	GD05623140	62KΩ
RH02	1	GD05623140	62KΩ
RH03	1	GD05333140	33KΩ
RH04	1	GD05333140	33KΩ
RH05	1	GD05392140	3.9KΩ
RH06	1	GD05392140	3.9KΩ
RH07	1	GD05114140	110KΩ
RH08	1	GD05114140	110KΩ
			(M1050, ONLY)
RN01	1	GD05822140	8.2KΩ
RN02	1	GD05822140	8.2KΩ
RN03	1	GD05822140	8.2KΩ
RN04	1	GD05822140	8.2KΩ
RN05	1	GD05303140	30KΩ
RN06	1	GD05303140	30KΩ
			(M1072, ONLY)
RN01	1	GD05682140	6.8KΩ
RN02	1	GD05682140	6.8KΩ
RN03	1	GD05682140	6.8KΩ
RN04	1	GD05682140	6.8KΩ
RN05	1	GD05473140	47KΩ
RN06	1	GD05473140	47KΩ
RN07	1	GG05471140	470Ω
RN08	1	GG05471140	470Ω
RN09	1	GG05471140	470Ω
RN10	1	GG05471140	470Ω
RN22	1	GD05682140	6.8KΩ
RN23	1	GD05434140	430KΩ
RN25	1	GD05224140	220KΩ
RN26	1	GD05124140	120KΩ

REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
			(M1050, ONLY)
RN21	1	GD05103140	10KΩ
RN24	1	GD05124140	120KΩ
			(M1072, ONLY)
RN21	1	GD05153140	15KΩ
RN24	1	GD05224140	220KΩ
RV01	1	GD05104140	100KΩ
RV02	1	GD05104140	100KΩ
RV03	1	GD05394140	390KΩ
RV04	1	GD05394140	390KΩ
			P700-SEMICONDUCTORS
Q401	1	HT110392A0	Transistor 2SA1039 (R or S)
Q402	1	HT110392A0	Transistor 2SA1039 (R or S)
Q403	1	HT323902A0	Transistor 2SC2390 (R or S)
Q404	1	HT323902A0	Transistor 2SC2390 (R or S)
Q405	1	HT323902A0	Transistor 2SC2390 (R or S)
Q406	1	HT323902A0	Transistor 2SC2390 (R or S)
Q701	1	HT110392A0	Transistor 2SA1039 (R or S)
Q702	1	HT110392A0	Transistor 2SA1039 (R or S)
Q703	1	HT110392A0	Transistor 2SA1039 (R or S)
Q704	1	HT110392A0	Transistor 2SA1039 (R or S)
Q705	1	HT323902A0	Transistor 2SC2390 (R or S)
Q706	1	HT323902A0	Transistor 2SC2390 (R or S)
Q707	1	HT322352A0	Transistor 2SC2235 (O or Y)
Q708	1	HT322352A0	Transistor 2SC2235 (O or Y)
Q709	1	HT323902B0	Transistor 2SC2390 (S or E)
Q710	1	HT323902B0	Transistor 2SC2390 (S or E)
Q719	1	HD20003210	Diode 1S2471
Q720	1	HD20003210	Diode 1S2471
Q721	1	HD30039090	Zener WZ-240
Q722	1	HD20005010	Diode W06B
			(M1050, ONLY)
Q711	1	HT316272A0	Transistor 2SC1627A (O or Y)
Q712	1	HT316272A0	Transistor 2SC1627A (O or Y)
Q713	1	HT108172A0	Transistor 2SC817A (O or Y)
Q714	1	HT108172A0	Transistor 2SC817A (O or Y)
Q715	1	HT407162A0	Transistor 2SD716 (R or O)
Q716	1	HT407162A0	Transistor 2SD716 (R or O)
Q717	1	HT206862A0	Transistor 2SB686 (R or O)
Q718	1	HT206862A0	Transistor 2SB686 (R or O)
			(M1072, ONLY)
Q711	1	HT322352A0	Transistor 2SC2235 (O or Y)
Q712	1	HT322352A0	Transistor 2SC2235 (O or Y)
Q713	1	HT109652A0	Transistor 2SA965 (O or Y)
Q714	1	HT109652A0	Transistor 2SA965 (O or Y)
Q715	1	HT407182B0	Transistor 2SD718 (R or O)
Q716	1	HT407182B0	Transistor 2SD718 (R or O)
Q717	1	HT206882B0	Transistor 2SB688 (R or O)
Q718	1	HT206882B0	Transistor 2SB688 (R or O)

REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
Q801	1	HT316272A0	Transistor 2SC1627A (O or Y)
Q802	1	HT323902B0	Transistor 2SC2390 (S or E)
Q803	1	HD30023090	Zener WZ-071
Q805	1	HD30024090	Zener WZ-120
Q810	1	HD20005010	Diode W068
Q812	1	HT108172A0	Transistor 2SA817
Q813	1	HT323902B0	Transistor 2SC2390
			(M1050, ONLY)
Q806	1	HD20009290	Diode S2V-20
Q807	1	HD20009290	Diode S2V-20
Q808	1	HD20009290	Diode S2V-20
Q809	1	HD20009290	Diode S2V-20
			(M1072, ONLY)
Q806	1	HD20011290	Diode
Q807	1	HD20911290	Diode
Q808	1	HD20911290	Diode
Q809	1	HD20911290	Diode
QE01	1	HT110392A0	Transistor 2SA1039 (R or S)
QE02	1	HT110392A0	Transistor 2SA1039 (R or S)
QE03	1	HT323902B0	Transistor 2SC2390 (S or E)
QE04	1	HT323902B0	Transistor 2SC2390 (S or E)
QE05	1	HT323902B0	Transistor 2SC2390 (S or E)
QE06	1	HT323902B0	Transistor 2SC2390 (S or E)
QN01	1	HT323902A0	Transistor 2SC2390 (R or S)
QN02	1	HT323902A0	Transistor 2SC2390 (R or S)
QN03	1	HT110392A0	Transistor 2SA1039 (R or S)
QN04	1	HT110392A0	Transistor 2SA1039 (R or S)
QN05	1	HD20001210	Diode 1S2473
QN06	1	HD20001210	Diode 1S2473
QN07	1	HD20001210	Diode 1S2473
QN08	1	HD20001210	Diode 1S2473
QN09	1	HD20001210	Diode 1S2473
QN10	1	HD20001210	Diode 1S2473
QN11	1	HD20001210	Diode 1S2473
QN12	1	HD20001210	Diode 1S2473
QN13	1	HD20005010	Diode W06B
QN14	1	HD20005010	Diode W06B
QN15	1	HD20005010	Diode W06B
QN16	1	HD20005010	Diode W06B
QN21	1	HT323902A0	Transistor 2SC2390 (R or S)
QN22	1	HT323902A0	Transistor 2SC2390 (R or S)
QN23	1	HT110392A0	Transistor 2SA1039 (R or S)
QN24	1	HT110392A0	Transistor 2SA1039 (R or S)
QN25	1	HD30023090	Zener WZ071
QN26	1	HD30023090	Zener WZ071
QN27	1	HT110392A0	Transistor 2SA1039 (R or S)
QN28	1	HT323902A0	Transistor 2SC2390 (R or S)
QN29	1	HD20001210	Diode 1S2473 (M1072, ONLY)
QN30	1	HT110392A0	Transistor 2SA1039 (R or S)
QN31	1	HD20005010	Diode W06B

REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
			P700-MISCELLANEOUS
L701	1	LL23915120	Choke Coil
L702	1	LL23915120	Choke Coil
JV01	1	YT02040280	Terminal (M1072, ONLY)
JV02	1	YT02040280	Terminal (M1072, ONLY)
JV03	1	YT02060140	Terminal (M1050, ONLY)
JV04	1	YT02050010	Terminal
SV01	1	SR04030220	Rotary Switch, Selector
SV05	1	SR04020150	Rotary Switch, Monitor
J805 ≀ J808	4	YJ08000270	Jack, Fuse Holder
P811	1	3444118050	Spacer
			PF00-TONE CIRCUIT BOARD
PF00	1	YH22742210	P.W. Board, Tone
	1	ZZ22742210	P.W. Board Assembly
			PF00-CAPACITORS
CF01	1	DF15224300	Film 0.22μF ±5%
CF02	1	DF15224300	Film 0.22μF ±5%
CF03	1	DF15223300	Film 0.022μF ±5%
CF04	1	DF15223300	Film 0.022μF ±5%
CF05	1	DF15333300	Film 0.033μF ±5%
CF06	1	DF15333300	Film 0.033μF ±5%
CF07	1	EA10701090	Elect 100μF 10V
CF08	1	EA10701090	Elect 100μF 10V
CF09	1	DF15332300	Film 0.0033μF ±5%
CF10	1	DF15332300	Film 0.0033μF ±5%
			PF00-RESISTORS **(All Resistors are ±5% and ¼W)**
RF01	1	RS01040080	Variable Resistor (Bass)
RF02	1	RS01040080	Variable Resistor (Treble)
RF03	1	GD05162140	1.6KΩ
RF04	1	GD05162140	1.6KΩ
RF05	1	GD05153140	15KΩ
RF06	1	GD05153140	15KΩ
RF07	1	GD05183140	18KΩ
RF08	1	GD05183140	18KΩ
RF09	1	GD05431140	430Ω
RF10	1	GD05431140	430Ω
RF13	1	GD05392140	3.9KΩ
RF14	1	GD05392140	3.9KΩ

REF. DESIG.	Q'TY N	PART NO.	DESCRIPTION
			PS00-LOUDNESS CIRCUIT BOARD
PS00	1	YH22741210	P.W. Board, Loudness
	1	ZZ22741210	P.W. Board Assembly
			PS00-CAPACITORS
CS01	1	DK16681300	Ceramic 680pF ±10%
CS02	1	DK16681300	Ceramic 680pF ±10%
CS03	1	DF15473300	Film 0.047μF ±5%
CS04	1	DF15473300	Film 0.047μF ±5%
			PS00-RESISTORS **(All Resistors are ±5% and ¼W)**
RS01	1	GD05333140	33KΩ
RS02	1	GD05333140	33KΩ
RS03	1	GD05822140	8.2KΩ
RS04	1	GD05822140	8.2KΩ
			PS00-SWITCH
SS01	1	SP02010260	Push Switch, Loudness
			PS50-VOLUME CIRCUIT BOARD
PS50	1	YH22741220	P.W. Board, Volume
	1	ZZ22741220	P.W. Board Assembly
RS51	1	RM01040230	Variable Resistor 100KΩ x 2
			PY00-L.E.D CIRCUIT BOARD
PY00	1	YH22742220	P.W. Board, L.E.D
	1	ZZ22742220	P.W. Board Assembly
QY01	1	HI10004030	L.E.D SLP-132B

(W01-99)	Assembly and Wiring
(T01-99)	Adjustment
(X01-00)	Correction

14. TECHNICAL SPECIFICATIONS

14.1 Model 1072

AUDIO SECTION

POWER OUTPUT, DIN, 4 OHM, PER CHANNEL 77W
POWER OUTPUT, FTC AMERICAN STANDARDS, 4 OHM, PER CHANNEL 46W
TOTAL HARMONIC DISTORTION AT RATED POWER OUTPUT 0.08%
I.M. DISTORTION AT RATED POWER OUTPUT
(250 Hz AND 8 kHz MIXED, AMPLITUDE RATIO 4:1) 0.08%

POWER OUTPUT, DIN, 8 OHM, PER CHANNEL 50W
POWER OUTPUT, FTC AMERICAN STANDARDS, 8 OHM, PER CHANNEL 36W
TOTAL HARMONIC DISTORTION AT RATED POWER OUTPUT 0.05%
I.M. DISTORTION AT RATED POWER OUTPUT
(250 Hz AND 8 kHz MIXED, AMPLITUDE RATIO 4:1) 0.05%
POWER BANDWIDTH ..... 15 Hz ~ 60 kHz
DAMPING FACTOR 8 OHM 45

Frequency Tesponse
Phono (RIAA) ..... ±0.5 dB
Aux (±1 dB) ..... 15 Hz ~ 60 kHz
Input Terminals
Phono: Input Impedance ..... 47k ohms
Input Capacitance ..... 100 pF
Input Sensitivity ..... 2.0 mV
Overload Margin ..... 35 dB
Aux: Input Impedance ..... 25k ohms
Input Sensitivity ..... 180 mV
Phono Equivalent Input Noise ..... 0.5 μV
Phono Dynamic Tange (Ratio of input overload to equivalent input noise) ..... 100 dB
Channel Balance (0 to −40 dB/40 Hz ~ 16 kHz)
Phono ..... 3.0 dB
Aux ..... 3.0 dB
Interchannel Crosstalk
Phono, 1 kHz ..... 47 dB
Aux, 1 kHz ..... 62 dB
Tape, 1 kHz ..... 62 dB
Intersource Crosstalk (Worst Point), 1 kHz ..... 55 dB
Output Voltage, 1 kHz
Tape Out ..... 775 mV
Output Impedance, 1 kHz
Tape Out ..... 220 ohms
Headphone Jack Load Impedance ..... 4 ohms

GENERAL

Power Requirements ..... 220V AC, 50 Hz
(E and N versions are featuring an external voltage selector for use on 110/120/240V. Other versions can be converted by a qualified technician to operate on 110/120/240V.)
Power Consumption at Rated Output, both Channels Driven ..... 160W ± 20W
Idling Power ..... 14W ± 5W
Semiconductor Complement
Transistors 45
Diodes 26
Dimensions
Panel Width ..... 416 mm (16-3/8 inches)
Panel Height ..... 146 mm (5-3/4 inches)
Depth ..... 240 mm (9-7/16 inches)
Weight
Unit Alone ..... 8.0 kg (17.6 lbs)
Packed for Shipment ..... 8.5 kg (18.7 lbs)

14.2 Model 1050

AUDIO SECTION

POWER OUTPUT, DIN, 4 OHM, PER CHANNEL	**51W**
POWER OUTPUT, FTC AMERICAN STANDARDS, 4 OHM, PER CHANNEL	**30W**
TOTAL HARMONIC DISTORTION AT RATED POWER OUTPUT	**0.1%**
I M. DISTORTION AT RATED POWER OUTPUT (250 Hz AND 8 kHz MIXED, AMPLITUDE RATIO 4:1)	**0.1%**
POWER OUTPUT, DIN, 8 OHM, PER CHANNEL	**40W**
POWER OUTPUT, FTC AMERICAN STANDARDS, 8 OHM, PER CHANNEL	**25W**
TOTAL HARMONIC DISTORTION AT RATED POWER OUTPUT	**0.1%**
I.M. DISTORTION AT RATED POWER OUTPUT (250 Hz AND 8 kHz MIXED, AMPLITUDE RATIO 4:1)	**0.1%**
POWER BANDWIDTH	**20 Hz ~ 50 kHz**
DAMPING FACTOR 8 OHM	**45**
Frequency Tesponse	
Phono (RIAA)	±0.5 dB
Aux (±1 dB)	20 Hz ~ 50 kHz
Input Terminals	
Phono: Input Impedance	47k ohms
Input Capacitance	100 pF
Input Sensitivity	2.1 mV
Overload Margin	35 dB
Aux: Input Impedance	25k ohms
Input Sensitivity	180 mV
Phono Equivalent Input Noise	0.5 μV
Phono Dynamic Tange (Ratio of input overload to equivalent input noise)	100 dB
Channel Balance (0 to –40 dB/40 Hz ~ 16 kHz)	
Phono	3.0 dB
Aux	3.0 dB
Interchannel Crosstalk	
Phono, 1 kHz	47 dB
Aux, 1 kHz	62 dB
Tape, 1 kHz	62 dB
Intersource Crosstalk (Worst Point), 1 kHz	55 dB
Output Voltage, 1 kHz	
Tape Out	775 mV
Output Impedance, 1 kHz	
Tape Out	220 ohms
Headphone Jack Load Impedance	4 ohms

GENERAL

Power Requirements	220V AC, 50 Hz
(E and N versions are featuring an external voltage selector for use on 110/120/240V. Other versions can be converted by a qualified technician to operate on 110/120/240V.)	
Power Consumption at Rated Output, both Channels Driven	110W ± 20W
Idling Power	11W ± 5W
Semiconductor Complement	
Transistors	45
Diodes	26
Dimensions	
Panel Width	416 mm (16-3/8 inches)
Panel Height	146 mm (5-3/4 inches)
Depth	240 mm (9-7/16 inches)
Weight	
Unit Alone	7.0 kg (15.4 lbs)
Packed for Shipment	7.5 kg (16.5 lbs)

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NOTICE : We hereunder show the substitute transistors stated in the parts list. In your ordering the parts from now on, please place your order of the parts in the column (B).

	(A)	(B)
(1)	HT323902A0 (2SC2390)	HT314001E0 (2SC1400)
	REF. DESIG. NO, (QN01, QN02, QN21, QN22, QN28, Q403 ~ Q406, Q705, Q706, Q709, Q710)	
(2)	HT323902B0 (2SC2390)	HT314001E0 (2SC1400)
	REF. DESIG. NO, (Q802, Q813, QE03, QE04, QE05, QE06)	
(3)	HT110392A0 (2SA1039)	HT107502C0 (2SA750)
	REF. DESIG. NO, (QE01, QE02, QN03, QN04, QN23, QN24, QN27, QN30, Q401, Q402, Q701, Q702, Q703, Q704)	